CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

SECRET [redacted] 25X1

COUNTRY	USSR (Leningrad Oblast)	REPORT [redacted]	25X1
SUBJECT	Electronic Development at Zavod 619, Leningrad	DATE DISTR.	8 November 1954
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THE SOURCE EVALUATIONS IN THIS REPORT ARE DEFINITIVE.
THE APPRAISAL OF CONTENT IS TENTATIVE.
(FOR KEY SEE REVERSE)

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Report referenced in attachment [redacted] 25X1

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STATE	X	ARMY	#X	NAVY	X	AIR	#X	FBI		AEC					

(NOTE: Washington distribution indicated by "X"; Field distribution by "#".)

1. MOON

Certain clarifying data was obtained in relation to the previous report.

In referring to the wave-length (frequency) of operation, source was originally firm in stating that the frequency range was 1500-1900 metres (200-157.9 k/cs.) but under detailed enquiry later modified this to the range of 150-125 k/cs., recalling that actually the Soviets had specified frequencies below the normal LF broadcasting band. Informant stated that separate coils and condensers were used for each range, and a total of 12 tuned elements were switched, i.e. 4 channels with one coil each for RF, mixer and oscillator circuits. However, information from another reliable source supports the 2-channel version receiver. Source also supported the change in his original frequency estimate by later recalling that they had experienced interferance from RADIO MOSCOW (153 kc/s.) on one band. Source stated that his main development difficulties arose in attempts to obtain suitable pedestals and fast sweeps, and in maintaining amplitude balance between the three signals. This latter problem was one reason why the Soviets themselves had concentrated on the LORAN mode of operation, where only two signals are maintained at a constant amplitude during measurement. In informant's circuit the I.F. is negatively biassed except during the pedestal intervals, the average level of sensitivity being manually controlled by screen grid bias, the average level is then adjusted to the desired master amplitude and the B or C slave amplitudes are manually set by separate control of the slave pedestal amplitude. This in turn modifies the I.F. sensitivity during the period of reception of the slave signals. Amplitude balance was maintained even with signal ratios as high as 1400:1 (See Annex 'B'). Difficulties were encountered in attempting to maintain the pedestal shape during gated periods. In order to obtain the desired step control of amplitude, very low values of plate resistance were used in the control tubes (6 SN 7). The resultant high average plate current considerably shortens the life of these tubes. Source stated that after completion

of his initial receiver, he concentrated on developing a receiver/ indicator for true cycle matching, and stated that he had succeeded in developing the bread board model before leaving Zavod 619. He stated that he employed an eleven element RF filter for the input followed by sufficient number of RC coupled triode (6 SN 7) amplifiers to bring the overall gain up to 4 x 10^7. Again, source could not remember the design centre frequency of his filter, nor the band width. Source stated that in competition with the Soviets he was able to perform a fix measurement in 40 seconds as compared to the three minutes required for obtaining a fix on the Soviet LORAN receiver. Source claimed that in spite of the proven increase in speed of reading, the Soviets gave no evidence of a desire to modify their method of operation or measurement.

Source stated that on several occasions he saw factory produced samples of both types of equipment, i.e. his type and straight LORAN which were stored in the laboratory used by him, KOTOWSKI and FEUSSNER. He never saw factory samples of his airborne receiver. In conversation with a Russian engineer, source gathered the impression that a ground installation was being erected in 1950 at a place called POLYGON, which he believed to be within a radius of 60 to 70 kilometres of LENINGRAD. Informant does not know which system was being built.

Source further stated that he did not believe the Soviets would use any of the German work in their system as they never showed any enthusiasm for the German developments, nor were any of source's airborne receivers ever built so far as he knows. Source had a strong opinion that the Soviets intended to place a number of chains around the borders of the USSR. This was based on original conversations of Professor STILLERMAN in 1946, subsequent conversations with Professor SIFOROV, and many subsequent bits of information. While he would not agree in so many words, source implied that this Navaid was desired solely for military operations beyond the borders of the USSR. In tests with small transmitters in the factory accuracies of match and reading of 5.0/us were normal and 3.0/us with good operation. The maximum accuracy obtainable would probably be 1.5/us. In an attempt to improve reading accuracy, a stable 500 kc/s generator was developed to provide 2 /as markers, but this was not a practical solution. He further claimed that with his cycle matching receiver accuracies of 0.3/us were achieved and this figure could be improved to 0.1/us.

On questions of propagation and associated errors source could offer little

Questioned about KOTOWSKI's work on the matter of using horizontal polarisation, source denied any knowledge of such work, although KOTOWSKI stated he had participated in discussions on the subject.

Source disclaimed any knowledge of Soviet work or documents on phase matching navigation and had the impression that they had done nothing, although he know MANDELSHTAM and PAPALEKSI were credited with discovery of the use of phase comparison hyperbolic systems in 1911. Questioned on the subject of components and materials, source stated that they were poor. Most of the materials he employed were ex German booty. Use of Soviet material was unsatisfactory as there was no catalogue of materials available, nor were there any data sheets on materials such as iron cores for RF coils. Test gear was American and German.

2. Visitors to Zavod 619

In 1948 an Army colonel visited Zavod 619 and tried to interest the Germans in a project of VHF communication utilising reflections from the moon. This technique the colonel had read of in a US publication. The main attempt was to get KOTOWSKI interested, but he completely declined.

In 1949 or 1950 STILLERMAN visited the laboratory and had a demonstration of the German developed system, but made no comment of which source is aware.

3. Synchro Detector Work

This was for SADOVNIKOV, but STARIK was interested. (For the principle, see Annex 'C').

4. Note on Zavod 619

Source has no information on the general organisation of Zavod 619 but had the impression that the main task was to build big sound transmitters. SADOVNIKOV's group comprised 60 high grade engineers. Informant formed the impression that they had other development tasks besides that of LORAN.

5. Note on NII 431

Source stated that it was common knowledge among the Germans that after 1952 NII 380 was rechristianed NII 431. He had no idea what the change of numbering signified. The previous Technical Head of NII 431 was DUBININ fnu, a leading television expert who was in America at one time. He is now dead. When source left LENINGRAD the Director of NII 431 was MOISEYEV, who is said to be a pleasant personality. Source believes that the main task of NII 431 was to build television transmitters. When he was there they were certainly building a television transmitter for KIEV.

PART III - INDEX OF PERSONALITIES

(Professor) ~~DRAUDE~~ - employed at NII 431. Is credited with the invention of the ionoscope.

DUBININ - leading TV man, formerly Technical Head of NII 431. Now dead.

~~KRUG~~ - lives in MOSCOW and a well known man of pulse techniques.

N. N. ~~KRYLOV~~ - Professor at LENINGRAD Polytechnic and a leading man of pulse techniques.

~~MEYEROVICH~~ - LENINGRAD; partly employed in the POSTS Institute and partly in the BUDENNYY Air Ministry Institute of which Professor ARENBURG is the Director.

~~MOISEYEV~~ - Director of NII 431 in 1953, pleasant personality.

PART IV - LIST OF APPENDICES AND ANNEXES

Appendices	-	Nil.
Annex 'A'	-	Sketch of Zavod 619 location.
Annex 'B'	-	Simplified Amplitude Balance Gating Circuit.
Annex 'C'	-	Synchro Detector.

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Annexe C.

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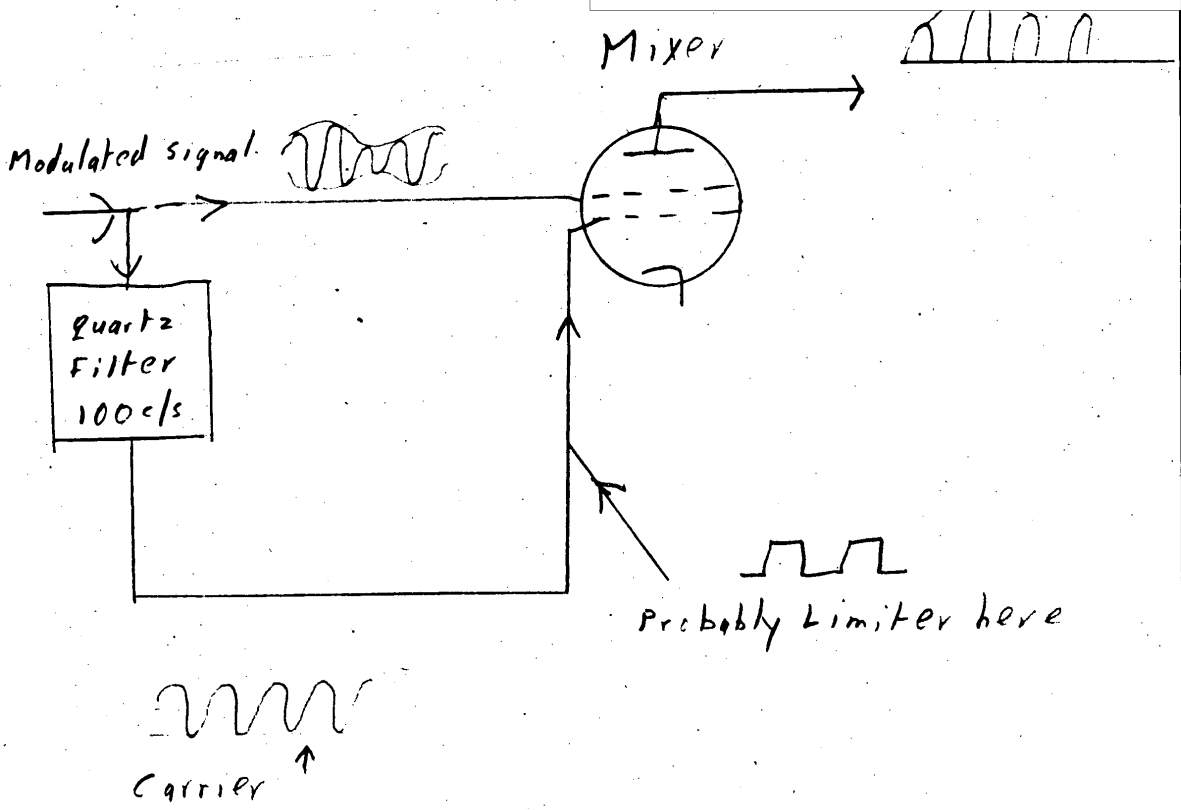


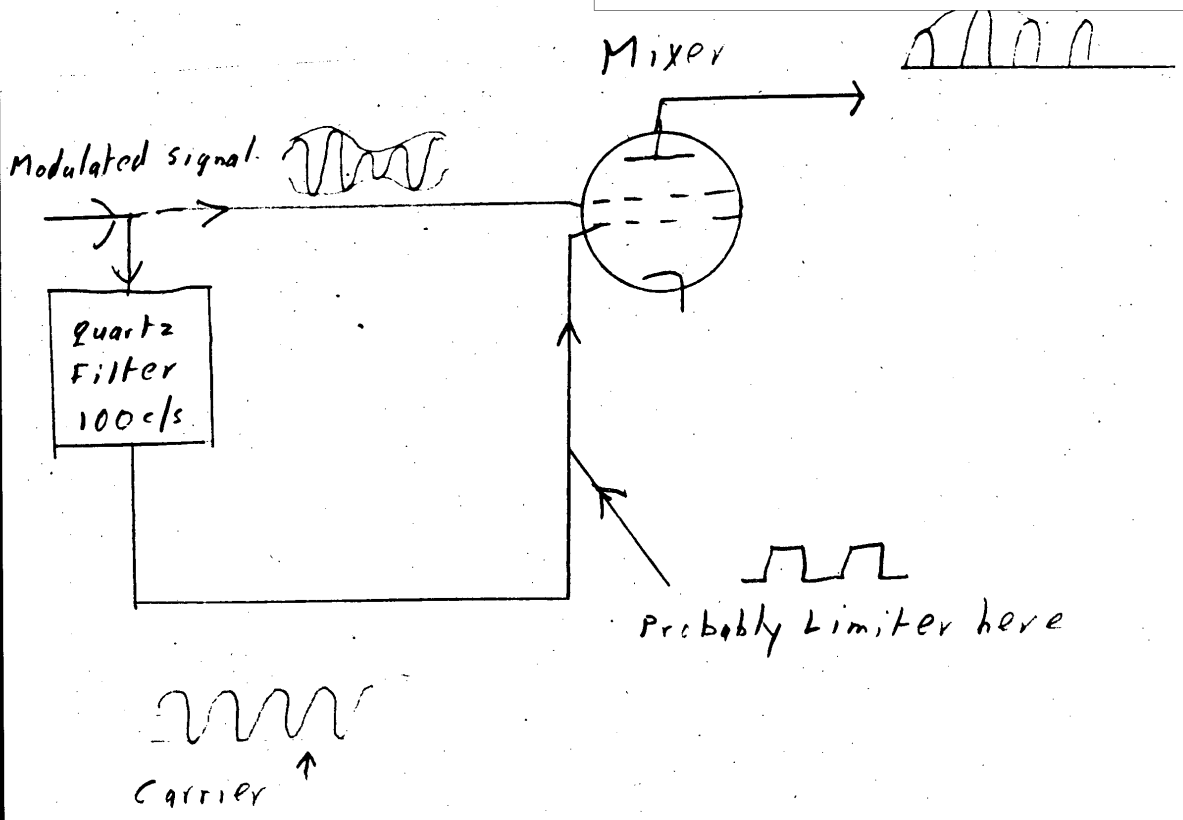
With conventional detector : Input $\frac{S}{N}$ à l. Output $\sim \left(\frac{S}{N}\right)^2$

Synchro Detector : Input $\frac{S}{N}$ à l. Output $\sim \frac{S}{N}$

Synchro Detector

Annexe C.

SECRET



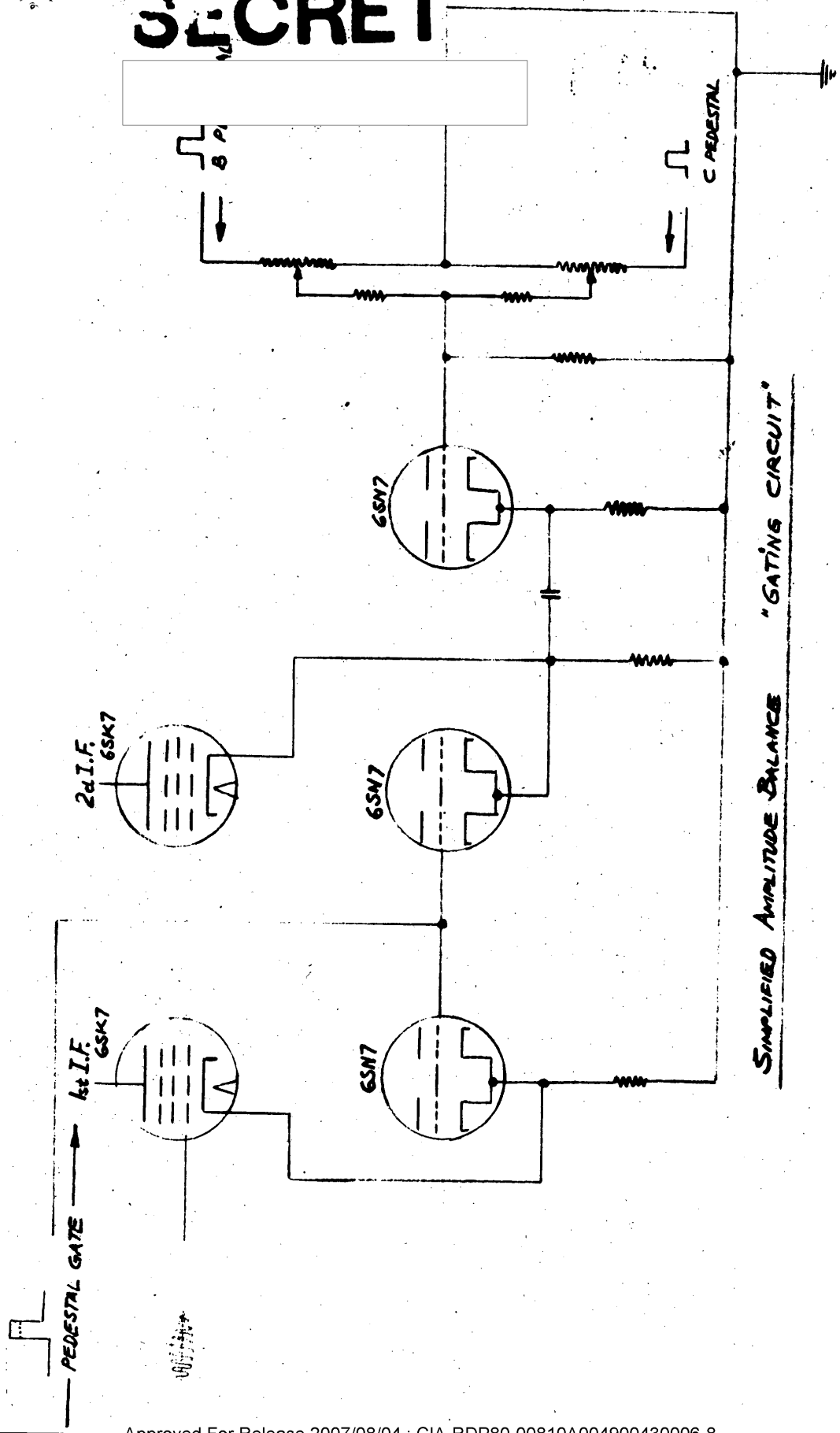
With conventional detector : Input $\frac{S}{N}$ & Output $\sim \left(\frac{S}{N}\right)^2$

Synchro Detector : Input $\frac{S}{N}$ & Output $\sim \frac{S}{N}$

Synchro Detector

Annex B.

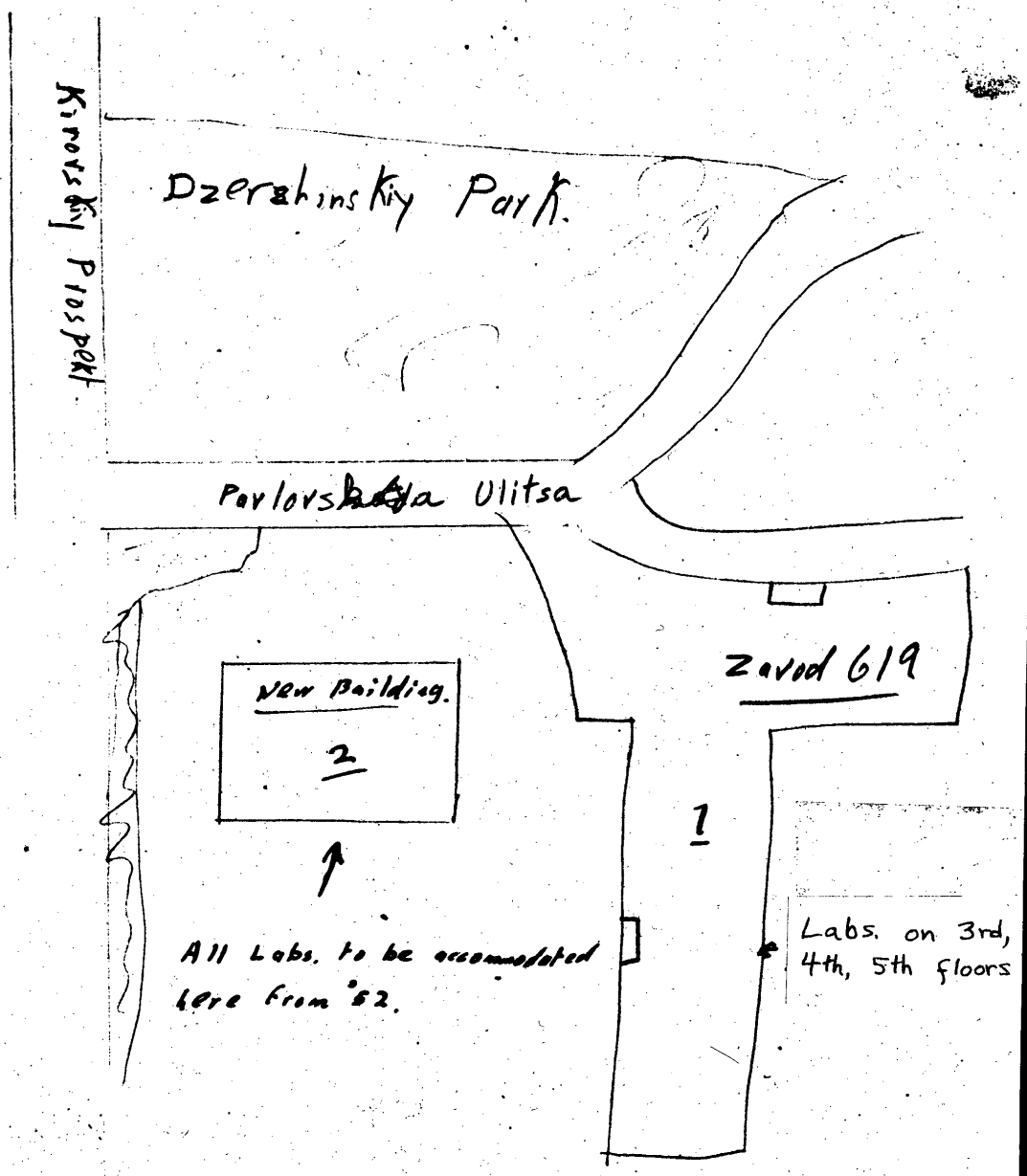
SECRET



SIMPLIFIED AMPLITUDE BALANCE "GATING CIRCUIT"

Annex A.

SECRET



Sketch Plan of Zavod 619. Location.
Leningrad.